FOREST PRODUCTS
Project Fact Sheet

IMPROVING DRYER AND PRESS EFFICIENCIES THROUGH COMBUSTION OF HYDROCARBON EMISSIONS

BENEFITS

- Decreased natural gas used in control equipment
- Decreased capital costs
- Improved product quality
- Decreased VOC emissions during drying and pressing

APPLICATIONS

The process will minimize the need for emission controls for the drying and pressing of hardwood and softwood. The unit will be retrofitted to existing dryers and presses.

New Technology May Eliminate Need for Expensive Emission Control Devices on Wood Dryers and Presses

The current technology used to dry and press wood requires expensive emissions controls to meet environmental regulations. The most commonly used emission control device is the RTO (Regenerative Thermal Oxidation) unit, which is energy intensive (natural gas) and has high operating and maintenance costs. Previous research to cut the costs of control equipment has focused on alternative control measures. The Institute of Paper Science and Technology (IPST) is taking a different approach. Researchers have found a way to alter the drying and pressing processes so that control units may be significantly reduced or even eliminated.

The project is based on results from a six-year industry-funded study from which IPST researchers have learned to predict and model the release of VOC streams during drying based on wood tissue temperature. The new technology improves the current processes by isolating hydrocarbon-rich emissions in a low-value stream and combusting in the burner, rather than subjecting them to costly control technologies. The remaining air would require little or no treatment.

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ENERGY EFFICIENCY AND RENEWABLE ENERGY • U.S. DEPARTMENT OF ENERGY

PROJECT DESCRIPTION

Goal: Develop strategies to alter dryer and press operations so that the volume of VOC-containing airstreams is reduced.

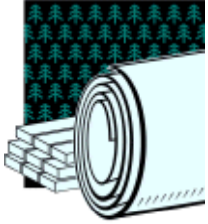
The project will begin by developing ways to isolate hydrocarbons released during drying in a low-volume stream at a concentration high enough to support combustion. Acquiring emissions data as a function of moisture content (MC) and temperature will also be a part of these initial efforts. Researchers will use data to develop an understanding of the relationship between drying practices and press emissions. Drying strategies will then be developed to reduce emissions with the goals of eliminating control technology for hardwood and reducing the size and energy requirements of the control unit for softwood. Models based on drying strategies will be used to estimate product performance from pressing operations.

PROGRESS & MILESTONES

- Results from a six -year wood consortium at IPST indicated that field-dried flakes have much higher emission levels than those of laboratory-dried material.
- Researchers have also gathered information that will allow them to predict VOC emissions from wood temperature. Thus, by manipulating drying parameters and segregating drying zones, it should be possible to isolate VOCs in streams that support combustion and vent the remaining air.
- Laboratory data will be collected and model development will begin in the first year.
- During the second year, researchers will complete initial modeling with laboratory data. A go/no-go decision will then be made based on initial model success.
- Researchers will complete fieldwork and run models to determine efficiencies and cost-benefits. The economics for applying strategies to both new dryers and retrofits will then be determined.

Awards, Patents, and Invention Records

- American Forest & Paper Association 1998 Environmental & Energy Achievement Award
- S.Banerjee, J.Boerner, W. Su, Method for Lowering the VOCs Emitted During Drying of Wood Products. U.S. Patent # 6,029,368 (2000).
- S.Banerjee, Mechanisms of Terpene Release During Sawdust and Flake Drying, Holzforschung, in press, 2001.
- L.P.Otwell, M.E.Hittmeier, U.Hooda, H.Yan, W.Su, S.Banerjee, HAPs Release from Wood Drying, Environmental Science Technology, 34, 2280, 2000.



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